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ABSTRACT

This document consists of three papers presented at a symposium on expertise in organizations moderated by Ross Azevedo at the 1996 conference of the Academy of Human Resource Development (AHRD). "How Individual Expertise May Be Socially Constructed: A Literature Review" (Abney V. Gleespen) looks at the research to determine the following: how knowledge precisely tuned to the experts' task situations is acquired; how experts' cultures contribute to expertise development; how performers help each other to become experts; and why performers help--or hinder--each other. "Experts and Expertise: The Status of the Research Literature on Superior Performance" (K. Peter Kuchinke) summarizes and critically reviews the status of the concept of expertise: its definitions, methodological approaches, theories of expertise, substantive research findings, and developmental issues. It proposes an agenda for future research and theory development. "Job Performance Goals: Bridging the Gap from Theory to Practice" (Richard J. Torraco) examines the reasons for the gap between the actual and potential role of job performance goals and suggests ways in which this gap can be bridged by systematically examining how performance goals are developed in organizations. To help close the gap between theory and practice, a theoretical framework for the development of performance goals is presented. Papers contain references. (YLB)

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How Individual Expertise May Be Socially Constructed: A Literature Review
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Experts and Expertise: The Status of the Research Literature on Superior Performance
K. Peter Kuchinke, University of Minnesota

Job Performance Goals: Bridging the Gap from Theory to Practice
Richard J. Torraco, University of Nebraska

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How Individual Expertise May Be Socially Constructed: A Literature Review

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Individuals must have extensive, specialized knowledge in order to perform at expert levels. Cultural factors influence whether individuals will be able and willing to acquire such knowledge. In particular, it seems useful for individuals to be surrounded by other performers who have some expertise, who are committed to furthering their own *involvement and advancement within their domains, and who are not dissuaded from helping and sharing with others because of interpersonal competition or other factors.*

Much research suggests that extensive, specialized *knowledge*—not generalized good thinking—is largely responsible for the superior performance of experts in various domains (e.g., Ericsson & Charness, 1994; Glaser & Chi, 1988). However, "knowledge" in this regard does not mean *formal* or *academic* knowledge only—or even primarily. Rather, the knowledge of an expert is a "repertoire" of themes, images, understandings, meanings, expectations, actions and techniques (Schön, 1983) that are derived from and exquisitely well-adapted to the expert's real-life task situations (Holyoak, 1991).

Part of an expert's knowledge is procedural. For an expert warehouse assembler, expert knowledge includes ways to fill an order using the fewest steps possible (Scribner, 1985). For an expert scientist, it includes ways to design experiments (Zuckerman, 1977). For an expert nurse or paramedic, it includes ways to create a sense of possibility for a very ill patient (Benner, 1984) or to intubate a bleeding one (Larson, 1991). For an expert writer, composer or other problem solver working in an ill-structured domain, expert knowledge includes ways to achieve better results by escalating task goals, reshaping one's understanding and revising one's work so that goals can be met (Scardamalia & Bereiter, 1991). (Non-experts, on the other hand, seem to "know" the opposite—i.e., that reconceptualizations and revisions are bad [Carey & Flower, 1989].)

Another part of an expert's knowledge is knowledge of what things are and how things happen. Such knowledge can enable an expert to select a procedure which produces superior results. For example, an expert nurse or physician will recognize a pattern of subtle physiological changes that may precede a heart attack in an elderly patient or respiratory distress in a premature baby (e.g., Benner, 1984). This understanding can enable the expert to choose a more appropriate medical intervention. In contrast, performers who lack this type of expert knowledge are unable to vary their actions appropriately in different situations (Hatano & Inagaki, 1993).

Case studies illustrate the role of extensive, specialized knowledge in the accomplishments of eminent performers. Woodward's encyclopedic knowledge of chemistry fueled his tremendous accomplishments in organic synthesis, for example (Woodward, 1989). Case studies of Picasso, Mozart, the Wright brothers, Watson and Crick (discoverers of the double-helix structure of DNA) and others indicate that extensive domain knowledge was an important factor behind their creative achievements—it was a much more important factor than people commonly realize (Weisberg, 1993). Case studies of striking accomplishments by less celebrated persons point to the critical role of knowledge, as well (e.g., Hunter, 1990; Sloboda, 1991).

Extensive knowledge can be beneficial because it is likely to capture many subtle but significant variations in problem settings, persons, objects and so forth, and because it is likely to capture the connections between these. Variety can help a performer to construct a more useful representation of a problem or task, and thus perform more effectively and efficiently (Spiro, Feltovich, Jacobson & Coulson, 1991a, 1991b), whereas lack of variety or lack of connectedness can do the opposite.

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Again, however, it is extensive knowledge attuned to real-life task situations—not simply academic knowledge—which tends to be most important. For example, among copier repair technicians, experts may be better distinguished by their knowledge of customers' usage patterns than by their knowledge of electronics *per se* (Orr, 1990). Evidence for the importance of task situation-specific knowledge can be found in the fact that performers in the same overall domain or industry, but in different task situations, use knowledge differently (e.g., Lesgold & Lajoie, 1991; Scribner, 1985; Smith, 1992) and create different knowledge to satisfy demands of their varying task situations. For example, tailors have created the concept of a "trousers' worth" as a unit of measure for cloth (Lave, 1985). Further evidence for the importance of situation-specific knowledge can be found in the fact that experts tend to perform much less well when they encounter tasks outside their areas of specialization or encounter atypical cases within their specialties (e.g., Patel & Groen, 1991). Finally, studies of analogical thinking suggest that while performers can make effective use of information from a variety of domains or task areas, they are less likely to do so, and less likely to do so effectively, when the information involves matters very different from the performers' target tasks (Weisberg, 1993).

An expert's knowledge may be largely tacit or implicit in addition to being extensive and complex (Bereiter & Scardamalia, 1993; Boreham, 1992; Jarvis, 1992). For this reason, it can be extremely difficult for a non-expert to appreciate the role expert knowledge plays in expert performance (Ericsson & Charness, 1994). To an observer who is unaware of an expert's special knowledge, expert performance may seem to result from supernatural reasoning, remembering or imagining processes (Hunter, 1990; Weisberg, 1993).

Lesgold and Lajoie (1991) describe an illustrative case in which an expert technician was able to repair a malfunctioning computer after lower-level technicians had failed, because the expert alone hypothesized (correctly) that data generated from a diagnostic program were inaccurate. It is tempting to view the expert as a better thinker, or at least a less inhibited one. In fact, the expert's accomplishment seems to have been the result of his greater familiarity with the social "process of designing a computer, planning how it will be maintained, creating diagnostic software, and actually doing the maintenance" (Lesgold & Lajoie, 1991, p. 308) in addition to his superior device knowledge. Similarly, the present author encountered an expert order processor who was able to calculate shipping target dates correctly where non-experts did not. Job guides had been given to all the order processors, so it might seem that the expert had superior sense-making skills or at least better reading abilities. Actually, the expert was using specific knowledge of shipping-performance standards applied to the company's manufacturing divisions as a supplement to her reading of the job guide. Differences in job roles and/or learning behaviors may help to explain how the experts in these examples acquired their special knowledge. It is worth noting, however, that these experts fit a pattern of experts generally knowing more about "systems and components at the limits of their job routine" (Lesgold & Lajoie, 1991, p. 313) and understanding better the relationships among disparate things, people and events relevant to their work.

In sum, research does not suggest that experts "do more with less." Rather, they seem to do more with *more*. What they have more of, is knowledge precisely tuned to the experts' task situations. How such knowledge is acquired is the focus of the next section of this paper.

What Performers Do, to Become Experts

The short answer to the question of how experts become experts is that they work at it very hard and very deliberately for a very long time. See, for example, Bloom (1985), Ericsson, Krampe and Tesch-Römer (1993), Gruber (1989), Hayes (1989), Howe (1990), Roe (1952) and Terman and Oden (1959). Persons who become experts start working hard earlier in their careers, compared to non-experts (Ericsson et al., 1993). They devote more hours each day to study and practice, and they study and practice more days each year (Ericsson et al., 1993). They use different methods, in comparison to non-experts, for learning in the course of preparing to perform and learning in the course of actually performing, but these methods are not short-cuts to

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excellence—they *increase* rather than decrease the time and effort performers must invest (e.g., Bereiter & Scardamalia, 1993; Chi & Bassok, 1989; Scardamalia & Bereiter, 1991).

It seems clear that persons who become experts tend to be highly motivated. Motivation leads those persons to invest greatly in their own development, which results, over time, in their acquisition of the extensive specialized knowledge, physical attributes and perhaps affective elements that facilitate expert-level performance (Ericsson et al., 1993; Hayes, 1989). But what is the origin of such motivation? How do even highly motivated performers manage to find sufficient time and resources for learning when faced with potentially competing demands for work, leisure and so forth? Is motivation by itself sufficient? If not, then what else is needed? Research suggests that the answers to all these questions point to cultural factors as significant influences on expertise development. A cultural theory of expertise development need not assert that performance differences are due entirely to environmental differences, but must endeavor to explain how experts' cultures could contribute to learning and development so that acquisition of expert-level performance capacity becomes more likely. The next section of this paper attempts to do just that.

Cultural Factors Behind Expertise Development

Initial evidence of a cultural basis for individual expertise can be found in cross-cultural or comparative cognition studies that show links between performance levels among certain groups of individuals, and specific experiences provided by the individuals' participation in cultural activities (such as work) or special encouragement from other cultural participants. These studies have provided evidence of a cultural basis for early motor skills, clay conservation, adeptness in business math, figural and spatial abilities, and abilities to sort and describe various types of stimuli (Mistry & Rogoff, 1985; Okagaki & Sternberg, 1991). Interestingly, some of these studies show that performance levels can drop when a task situation is altered slightly by the replacement of culturally familiar artifacts with culturally unfamiliar ones. They also suggest that variations in task situation experience can produce significant differences in cognition. These findings echo the expertise literature.

Studies of interventions designed to improve intellectual abilities suggest that such abilities are amenable to training, but that there is a tendency for performers to regress to "normative levels of their milieux, in the face of their dominant socialization experiences" (Fowler, 1990, p. 182). These studies are further evidence of a cultural basis for expertise.

Most pertinent to this paper, perhaps, are case studies of the learning backgrounds of highly accomplished performers. Studies have been done in various domains, including language, science, art, mathematics, music and sports (e.g., Fowler, 1986, 1990; Gustin, 1985; Howe, 1990; Kalinowski, 1985; Monsaas, 1985; Sloane & Sosniak, 1985; Sloboda, 1991; Sosniak, 1985a, 1985b; Subotnik, 1992, 1993a, 1993b, 1994; Weisberg, 1993; Woodward, 1989; Zuckerman, 1977). What these studies reveal above all is that highly accomplished performers tend to have come from environments *saturated* with resources, opportunities and incentives for the development of expertise in the domains favored by members of the performers' cultures. The studies suggest that cultures help to sustain individuals' motivation to engage in the protracted, effortful learning activities that produce expertise. Cultural arrangements provide subsistence and time for individuals to learn, and provide the additional elements such as tools, information and examples that individuals must have if they are to become experts. At least, this is true of some cultures.

To some extent, in the cultures from which highly accomplished performers come, learning resources, opportunities and incentives are provided by persons in teaching roles for the conscious purpose of developing expertise in learners. This is especially true for young learners. But increasingly, as the learners move into adulthood, learning resources, opportunities and incentives are generated by fellow members of the learners' cultures *incidentally*, as byproducts of those members' own efforts to learn and practice at expert levels. Some of these resources and so forth are generated in formal learning contexts. Many more appear to be generated in informal learning contexts. This phenomenon is in accord with research which shows that informal and incidental learning, and learning through participation in communities of practice, are important

modes of learning among adults (Lave & Wenger, 1991; Watkins & Marsick, 1992). But the case studies of highly accomplished performers highlight one additional significant point: The persons who facilitate expertise development among performers who become experts are not *just* practitioners, typically. Rather, they are practitioners who have already acquired a degree of expertise themselves *and* who are ambitious to become still better.

How Performers Help Each Other to Become Experts

The case studies of highly accomplished performers, together with studies of learners' interactions in workplaces (e.g., Albrecht & Hall, 1991; Hutchins, 1993; Keller & Keller, 1993; Larson, 1991; Lave & Wenger, 1991; Orr, 1990) and schools (e.g., Cuellar, 1992), illustrate the ways that performers and their cultural co-participants help each other to acquire and perfect expertise. These studies indicate that successful learners acknowledge each others' special interests and abilities, collaborate in learning ventures and experiments, critique each others' efforts, observe and copy each others' successes, share tips, trade "war stories," discuss innovations, display accomplishments, develop and disseminate job guides and tools, accompany each other at cultural events where new ideas can be assimilated, share language, pose questions, identify problems and proffer explanations for each other, among other things. Such learners pursue and attain high levels of achievement.

Less successful learners do some of these things too, but less frequently, less enthusiastically and with less knowlege and skill. Moreover, less successful learners do other things that actively diminish each others' learning prospects (e.g., Cuellar, 1992; Freeman, 1993; Suskind, 1994). For example, they pressure learners to invest their time in non-learning endeavors. They model the non-pursuit and non-attainment of expertise in their own activities, and they disclaim learners' interests, abilities and achievements. When they attend formal learning sessions, they are disruptive. In some instances, they ridicule or threaten learners who try to improve their knowledge and skills. (One classmate described a learner's efforts to improve as a form of "disrespect" for his less ambitious peers, [Suskind, 1994].) In other instances they undermine learning efforts in more subtle ways, such as ignoring questions or objections from performers who notice problems in task situations (Hatano & Inagaki, 1993).

Co-participants of successful learners accomplish a number of things through the types of behaviors described above. They model values and behaviors that favor learning and achievement, which can sustain learners' motivation and show them useful ways to learn. They reward learning and achievement informally with attention and admiration, which can further sustain motivation. In some cases, they also help to create or maintain formal reward systems. Through their successes, they help to create attractive, exciting venues for accomplishment. By integrating learning with work and recreation—for example, by trading "war stories" during lunch breaks—they create more time for learning and they reduce the odds that learning will be undermined by competing needs for subsistence or diversion. They help to insure that expertise development will not be too profitless, too dull or too lonely an enterprise to be sustained.

Many researchers have noted, however, that motivation and learning effort are not by themselves sufficient to insure expertise development. Learners must have *high-quality* examples to build upon. They must have *accurate*, credible feedback. And they must encounter the artifacts of their domains with sufficient *frequency* and *variety* to support construction of the kinds of knowledge that facilitate performance at expert levels—the kinds of knowledge described at the start of this paper (e.g., Ericsson & Charness, 1994; Hatano & Inagaki, 1993). For these reasons, it can be quite advantageous for learners to have co-participants who are highly skilled as well as highly ambitious.

Expert performers are more likely than non-experts to be able to generate high quality information, ideas and examples. Their opinions and examples are more valued by learners, in many cases. Knowledgeable, interested performers are likely to generate greater quantities of discussion oriented toward learning, achievement and innovation. Not all such discussion may be equally valuable, but the odds of producing valuable insights seem to be increased when such

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discussion increases (Albrecht & Hall, 1991). Environments populated by experts may provide exposure to greater varieties of domain artifacts. Non-experts' repertoires are more constrained, and this seems at least partially attributable to experiential deprivation due to cultural factors (Freeman, 1993). Expert environments may produce a kind of overlearning, which is useful because the knowledge a performer will require for future tasks cannot always be precisely predicted (Orr, 1990).

Expert environments may provide redundant learning opportunities. For example, a learner will not only be formally trained to perform a procedure, but will see it done and hear it discussed in authentic practice settings by other, expert performers. Even the tools and technologies of the task environment, which expert performers may have helped to create, can reinforce the appropriate procedure (Hutchins, 1993). Such redundancy may be useful where a principle or procedure is not easily apprehended through a single mode or instance of learning.

Expertise tends to be highly specific to task situations, as the first section of this paper explained. Information and examples from persons who are *not* currently expert task performers may have low utility, therefore. For this reason too, it can be very advantageous for learners to be surrounded by expert performers who share insights in the course of their practice.

Why Performers Help—Or Hinder—Each Other

Why do performers facilitate expertise development in each other? In fact, they do *not* in all cases. As described above, less successful performers create cultures of "negativism and animosity that...[are] constantly strengthened" by the performers' own behaviors (Cuellar, 1992, p. 23). But successful performers have also been shown to undermine co-participants' learning in some cases, through hazing, exclusion of co-participants from work and learning activities, and other means (e.g., Lave & Wenger, 1991; Watkins & Marsick, 1993).

Co-participants of the successful learners in the case studies described above were committed, often deeply committed, to the subject matters of their respective domains. They found them beautiful, fascinating, morally and practically significant. They were also strongly committed to their own development and advancement within those domains, in most cases. Their commitment and ambition led them to engage in behaviors that incidentally, it seems, generated resources, opportunities and incentives for other learners' advancement. For example, the co-participants asked questions of learners because *they* wanted to learn—not because they wanted to enlighten the learners through Socratic dialogue. Co-participants included learners in activities such as work and conversation because it was useful or enjoyable for the co-participants. They shared anecdotes and products of their work in order to publicize their own accomplishments and thus gain respect from other performers. Co-participants worked hard and generated good examples for learners to build upon in order to satisfy the co-participants' own high practice standards—not because they wanted to model achievement behaviors for the learners. In contrast, co-participants of the less successful learners were much less committed to their own development and advancement, and were thus less likely to engage in behaviors that supported learning by other performers.

In cases where successful co-participants are reluctant to support learning by other performers, concerns about competition are often implicated. For example, co-participants fear job loss, loss of status and so forth if other performers should become equally skilled and knowledgeable (e.g., Jacobs & Jones, 1995; Watkins & Marsick, 1994, p. 254). On the other hand, co-participants who facilitated learning by other performers in the studies described above *also* mentioned competition as a factor behind their behaviors (e.g., Larson, 1991, p. 146; Sloane & Sosniak, 1985; Sosniak, 1985b). What could explain this? Further research is needed, but many of the persons in the studies who did *not* aid learning among other performers appear to have been concerned primarily with *inter*personal competition (e.g., Monsaas, 1985). Interpersonal competition concerns might reduce interpersonal trust and cooperation. Lack of interpersonal trust can inhibit sharing of ideas and learning within relationships, research has suggested (e.g., Albrecht & Hall, 1991; Kram, 1985; Larson, 1991). Co-participants who did aid learning among other per-

formers appear to have been more focused on *intra*personal or *"goal* competition" (Griffin-Pierson, 1990), in which the successes of other performers served as referents but did not automatically translate into perceived losses for the co-participants. The case studies further suggest that environmental variables may have influenced the performers' varied competition orientations. For example, performers who had joint responsibilities for maintaining a piece of equipment had little reason to undermine each other's learning; they shared information and advice freely (Orr, 1990).

Conclusion and Recommendations

Fowler (1990, p. 179) has noted: "Perhaps most widely overlooked in the nature-nurture equation is how few life histories reflect even a moderate range of opportunities to acquire the skills, motivation and interest needed for excellence in any field." This paper has indicated that extensive, specialized knowledge is required for excellence in most fields and that cultural factors influence whether performers will be able and willing to acquire such knowledge. In particular, it seems useful for learners to be surrounded by co-participants who have expertise, who are committed to learning and who are not dissuaded from helping and sharing with other performers because of concerns related to interpersonal competition or other factors. It would be useful to have additional research on the effects of organizational factors on the expertise development and expertise sharing behaviors of performers. For example, what are the effects of formal training, employee involvement, downsizing, task designs, incentive structures and other variables? More generally, what are the differences between workplaces where performers share expertise and engage each other in learning endeavors, and workplaces where performers do not?

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Experts and Expertise: The status of the research literature on superior performance

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Employee expertise has emerged as one of the key concepts of the HRD profession. Yet the research base of expertise is incomplete. In this paper, the author summarizes and critically reviews the status of the concept: its definitions, methodological approaches, theories of expertise, substantive research findings, and developmental issues. In the conclusion, the author proposes an agenda for future research and theory development.

The development of employee expertise has been described as a key strategic imperative for organizations operating within a rapidly changing, hyper-competitive economic environment (Torraco & Swanson, 1995). Changes in technology, production processes, and management approaches in virtually all organizations have led to a renewed and continuing interest in expertise. Contrary to predictions that the introduction of advanced machinery and production technologies as well as the growth in service-sector jobs would lead to deskilling, or at a minimum to a polarization of skill requirements into a comparatively small group of highly skilled employees and a majority of employees with little more than manual or basic skills and knowledge (Reich, 1991), recent research indicates that the restructuring of the American economy has not led to a deskilling of work. A recent survey of U.S. private business establishments by the National Center on the Educational Quality of the Workforce and administered by the Bureau of the Census (The National Center on the Educational Quality of the Workforce, 1995), for instance, found that over one-half of American employers (56%) noted an increase in skill requirements in their organizations over past three years, only five percent reported a reduction, and 39% reported no change. In response, the vast majority of employers provide or pay for formal training (81% overall; 99% of organizations with 100 or more employees). Estimates of the annual expenditure for training provided by private U.S. employers alone range from $40 billion (for formal training) to $200 billion (for formal and informal training, including lost wages) (Eurich, 1985, 1990), thereby easily surpassing the amount of Federal spending on public post-secondary (2-year, 4-year, and graduate) education. One-half of this expense is passed along to consumers in form higher costs for products and services, the other half presents tax-write offs (Eurich, 1990.)

Expertise is of importance to individuals, organizations, and society at large (Bereiter & Scardamalia, 1993), and its development is at the core of the field of Human Resource Development (HRD), which, according to one university faculty group, is defined as "a process of developing and/or unleashing human expertise through organization development and personnel training and development for the purpose of improving performance" (HRD Faculty of the University of Minnesota, 1994)

The purpose of this paper is to investigate the concept of expertise by reviewing relevant research and to define the status of our understanding of the concept. As a novice in this area, and given the vast amount of literature related to expertise in various academic disciplines, this review will be cursory and serve to delimit the territory, rather than explore it in-depth. This paper will be restricted to expertise as an individual level construct, and will not address other levels of analysis, such as group, organization, or society, or expertise that can be built into processes or systems. This paper will further largely ignore situational or contextual variables that may elicit, further, or inhibit expertise. The source of this review is primarily the literature of cognitive psychology and the cognitive sciences, where the bulk of research has been conducted over the past several decades and where "research on expertise may be one of the most rapidly expanding areas (Ericcson & Smith, 1991, p. 1). The emphasis in the cognitive sciences is to model expertise and to understand its processes.

Definitions of Expertise

The term expertise is used in many different situations, carries a number of different connotations, is multi-dimensional, and, in general, has evaded clear definition (Salthouse, 1991). Expertise, like

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the term performance, often functions as a value judgment, as an expression of a social or consensual evaluation; someone who has expertise is typically seen as highly skilled and/or highly knowledgeable in some specific area, is presumably dedicated to keeping up-to-date through practice and/or continued learning, and has a high level of commitment to the area or domain of expertise. 'Self-styled experts' are distrusted, but we put faith in expert opinions and expert witnesses. Terms related to expertise are mastery, skill, competence, specialization, knowledge, savvy, and authority. Expertise is used in relation to behaviors, cognitive states, and attitudes. Kochevar (1994) for instance proclaims: "The power of an expert's performance is rooted in the superiority of his/her operative knowledge or 'expertise'. Expertise is the task specific knowledge used to perform typical tasks in a given domain" (p. 8). Johnson (1987) states that "expertise can most simply be defined as highly adaptive behavior. People who have expertise have a 'power' that allows them to achieve results; to get the right answers. Expert behavior is also fluent and efficient" (p. 12). Lastly, Salthouse (1991) reflects on the popular opinion that "an expert is anyone who has the self-confidence to consider himself or herself an expert" (p. 286).

Three observations become apparent from this cursory sampling of statements about expertise: First, expertise is defined in terms of what experts do, and for the most part the study of expertise has been the study of experts. This presents an important a priori constraint on our understanding of the phenomenon: it limits the extent to which we can comprehend developmental processes (how does one become an expert, develop expertise?), and presents the danger of confounding social labeling with the concept of interest (is X called an expert because she has expertise, or because of some social norm that assigns this label to some specific behavior or status irrespective of the degree of expertise, or both?). Campbell, McCloy, Oppler, and Sager (1993) point to a similarly confusing situation in regards to defining performance: " the word performance is misused and exploited to the extreme in society at large, and is frequently butchered beyond recognition in psychology" (p. 35). A similar situation has been observed in the study of leadership, where research has been conducted primarily on persons already in leadership positions. We will see in the following discussion about methodologies of studying expertise, how expertise research has tried to avoid this confound by restricting the range of expertise domains under study. Defining a construct in terms of its outcomes is a fallacy that makes predictive research using expertise as the independent variable impossible.

Second, expertise is expressed as behavior, in general, and performance, in particular. Mere behavioral potential, for instance a vast amount of knowledge, insight, or wisdom *without* proof that such cognitive prowess has stood the test of application is not sufficient. Being learned is a necessary, but not sufficient condition for expertise, but neither is behavior that is due to chance or plain luck, such as winning a large amount of money in a lottery. We do expect some consistent public display of expertise over time, or at least be able to trace successively more advanced accomplishments that may culminate in a singularly impressive work. On the other hand, expertise must be distinguished from its effects or results: expert performance may or may not be effective or efficient within a given, say organizational context. If we look at expertise as an individual level construct, then outcome variables such as productivity, or organizational level variables, such as competitive position may or may not result as the result of expertise. This issue is complex, however: popular usage of the term assigns to experts the ability to navigate within an organizational setting, that is to be system-savvy and to know how to apply their domain specific knowledge (introducing the concept of fit between expert and context). For research purposes (and evaluation purposes as well) however, the concept of expertise and its results should be kept apart. This caveat, too, parallels Campbell's *et al.* (1993) strong statement about performance and its possible outcomes:

> as an indicator of performance, effectiveness is by definition contaminated....if the research questions deal with predictor validities...focused on the individual, then the dependent variable should not be something that the individual cannot influence...[it] would be maximally informative to know the relationship of performance to effectiveness and not to confound them. (p. 41)

Third, if expertise has to do with behavior, then it makes sense to display the degree of expertise in a given area, say music, on a continuum from novice to expert behavior. A possible distribution may look like a normal curve (Salthouse 1991), whereby novice behaviors are represented at the low end of the curve and experts' at the extreme right. In fact, a common scheme for categorizing a given expertise domain is an ordinal scale with six categories: lay person, beginner, novice, intermediate, subexpert, and expert (Patel & Groten, 1991) This implies that in

any given area or domain, there will be a rather small number of experts, while the vast majority will perform at a lesser level.

In the following pages, expertise will be used synonymous with outstanding performance. This usage is consistent with writers such as Swanson (1995), Johnson (1987), and Harmon and King (1985), who heuristically define expertise as "skill and knowledge possessed by some humans that result in performance far above the norm" (Harmon & King, 1985, p. 259). The usage of high levels of performance for expertise, however, begs the question of what does the expertise research adds over and above what can be studied about performance. Concept redundancy has been a problem for organization behavior research in general (Schwab, 1980) and is to be avoided since scientific theories are aiming at parsimonious explanations.

Methodological approaches to studying expertise

Expertise research has progressed along two distinct lines of inquiry: the cognitive sciences have focused almost exclusively on the processes associated with the acquisition and representation of knowledge, and have largely ignored motivational components. Organizational behavior research, on the other hand, has addressed motivational components, such as the relationship of job satisfaction or task design on performance. The difficulty of capturing situational determinants of performance [the 'E' in Lewin's conceptual definition of behavior as: $B=f(PxE)$] has led to a preference for experimental designs with standardized situations and objective performance measures that preclude social indicators to confound the relationship of performance and evaluation. As a result, the range of tasks and performance domains in expertise research has been relatively narrow.

A second characteristic of expertise research has been the choice to account for expertise in terms of acquired rather than inherited characteristics. Early attempts of explaining and predicting outstanding performance centered on primarily inherited general characteristics (such as intelligence and personality traits) and inherited special abilities (for example: musical ability, artistic ability, body build). Galton (1869, cited in Ericsson & Smith, 1991), for example, attempted to account for the accomplishments of eminent individuals in a wide range of fields by studying their familial and genetic origins, and concluded that these individuals gained prominent standing in society because of a long history of achievement that was the result of a blend of intellectual (natural) ability and personal motivation. Such eminence, he concluded, was genetically determined and limited to a small number of families stemming from common ancestors. More recent lines of inquiry have concentrated on high performing individuals, and were based on "the belief that exceptionally high levels of performance would reflect some basic exceptional ability involving attention, memory, general speed of reaction, or command of logic [or] other stable individual characteristics such as features of personality, motivation, and perceptual style" (Ericsson & Smith, 1991, p. 5). This line of research has, however, proven inconclusive, as has the search of specific inherited characteristics as sufficient explanation for high performance. Whether in the area of musical pitch, athletics, or chess, "it becomes difficult to rule out the possibility that such characteristics [accounting for superior performance] have not been acquired as a result of many years of extensive training and practice...and most of the empirical evidence favors an account in terms of acquired skill" (Ericsson & Smith, 1991, pp. 6 - 7). While inherited characteristics or stable traits may favor or act as a prerequisite for the acquisition of certain skills, and act as boundary conditions for the level of proficiency attainable by an individual, these are seen as insufficient to explain and predict high performance; most of the research, consequently, has focused on acquired characteristics and the process of acquisition.

While some work in this area has used biographical sources and analyses of events and circumstances in the lives of outstanding scientists and artists (for example: McCurdy, 1983; Mindess, 1988), the original expertise approach (Ericsson & Smith, 1991) used standardized conditions to describe, analyze, and identify the components of the critical performance. To this end, research progresses along three distinct steps: (1) a collection of representative tasks is identified or developed that capture the relevant aspects of superior performance in a specific domain and elicit superior performance under laboratory condition; (2) a systematic empirical analysis of the processes leading to the superior performance is conducted and mediating processes identified; and (3) the types of learning or adaptation by which the mediating processes are acquired are analyzed and studied in real life and under laboratory conditions.

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Finding or designing tasks that capture the superior performance of experts in a given domain under controlled, that is laboratory settings imposes a clear limitation on the range of tasks or domains that can be investigated, but yields important advantages: first, the performance of the designed tasks will reflect the stable characteristics of superior real-life performance; second, the performance of such tasks under controlled conditions can yield sufficient information for assessing and analyzing mediating processes; and third, this methodological approach allows for the study of acquisition processes through practice. On the other hand, only for a select number of expertise domains is the collection of representative tasks easy or possible (for example memory experts or 'mental calculators'); in most other cases the design of standardized tasks to capture real life expert performance is difficult (Ericsson & Smith, 1991). This is especially true for ill-defined and ill-structured problems, which Newell and Simon (1972),defined as problems where (1) incomplete information about the initial situation is given; where (2) goals are vague or unspecified, and no specific situation exists that can be used as a target for problem solving activity; and (3) where incomplete or no information about the means for solving the problem is given, and the problem solver must generate substantial amounts of the material needed to obtain a solution for himself or herself. For complex task domains and ill-structured situations, such as physics and medical diagnosis, investigators "tend to select a small number of tasks without specifying the population from which those tasks were chosen to be a representative sample (Ericsson & Smith, 1991, p. 15).

In the second step, the analysis of expert performance, mediating processes have been inferred through direct observation of, for instance, a subject's eye movements during visually represented material, think-aloud verbalizations as subjects perform a small number of specific tasks, or retro-active reports of the reasoning applied to solve a specific problem. Think-aloud verbalizations of expert-novice comparisons is the best-known and most widely used method of assessing differences in the mediating processes as functions of the subjects' levels of expertise Examples of this method include comparisons of chess grand masters and novices, experienced physician and medical students, and expert and novice troubleshooting technicians.

Another commonly used method consists of extensive case studies of single subjects, where data on a large number of different tasks is collected on individual subjects. Examples here include case studies on individuals with the ability to perform calendar calculations, and memory experts.

Theories of Expertise

The first generation program of expertise research (Holyoak, 1991) from the mid-fifties through the early 1970's concentrated primarily on the study of "knowledge-lean" (Glaser, 1985, p. 1) tasks in which competence can usually be acquired over a short period of learning and experience. These studies explored the basic information processing capabilities that people employ in situations where they lack any specialized knowledge or skill. The historical development of this early research originated in the work of Norbert Wiener on cybernetics after World War II which encompassed information theory, the theory of feedback systems, and the electronic computer In 1954, Newell began work on programming a digital computer to learn to play chess, an effort within the greater context of an attempt to simulate an environment for an Air Defense radar center at the Systems Research Laboratory at RAND (Newell & Simon, 1972). Initial results were reported in a groundbreaking article by Newell and Simon (1958) and later summarized by Simon and Newell (1971), where the authors first described the requirements of a theory of problem solving, and stated their opposition to "mentalism and magic", that is "attempts to explain thinking by vague references to vague entities and processes hidden beyond the reach of observation within the skull" (Simon & Newell, 1971, p. 147). The replication of human thought processes through computer programs would yield "an iron-clad insurance against admitting magical entities into the head" (Simon & Newell, 1971, p. 148). The theory of problem solving was stated in terms of the human information-processing system, where a problem solver is confronted by an objectively defined task within a given task environment and problem space. Problem solving consists of a series of selective searches for information in the problem space and results in series of knowledge states that are progressively more inclusive and finally encompass the solution to the problem. The information processing system consists of three structures which are important in the study of human problem solving behavior: the sensory register, short-term memory, and long-term memory (Newell & Simon, 1972).

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The sensory register accepts information from the sensory organs (eyes, nose, etc.) and holds the information for a very short time. Memory of sensory input decays in less than a second, and information must be processed for storage in short-term memory. Short-term memory is the working memory for the information processing system, it is conscious, and limited in its ability to store information. Information in short-term memory will decay within about 15 seconds, unless transferred into long-term memory, which is believed to have an unlimited capacity for storing information (Anderson, 1995).

The problem space, which must be constructed or retrieved from long-term memory, consists of the initial condition (in which the given or starting conditions are represented); the goal condition (in which the final goal is represented); intermediate problem conditions (consisting of new conditions that are generated by applying an operator to a condition); and operators (the moves that result in a change from one condition to the next) (Mayer, 1983).

First generation expertise theories described a number of heuristic processes that were thought of as generically applicable to problem solving in many, if not all domains. These included 'hill climbing' (moving toward the target), progressive deepening (return to a base position after a particular move has been explored), scan-and-search strategy (moving to a new 'node' and scanning its immediate environment), means-end analysis, generate-and-test, and subgoal decomposition (Glaser, 1985).

Second Generation Theories on Expertise The promise of finding a small number of general rules-of-thumb that underlie problem solving behavior and expertise, however, did not prove itself out for more complex, knowledge-rich tasks. Studies of the reasoning processes of chess grand masters, physicists, physicians, computer programmers, and experts in a number of other domains demonstrated that general heuristic search methods are weak and characteristic of novices rather than expert performers. Glaser and Chi (1988) summarized the key characteristics of experts' performances that second generation research has uncovered:

1) Experts excel mainly in their own domain. Contrary to the hypothesis of expertise as a global thinking ability, or a number of general rules or processes that transfer from one domain to another, there is widespread agreement that expertise is domain-specific. Expertise requires a sufficiently large amount of domain-specific knowledge. When confronted with non-domain problems, experts' problem-solving behavior is much like that of novices.

2) Experts perceive large meaningful patterns in their domain. The knowledge base of experts is organized in chunks that are larger, that is: contain more detail information, than those of novices. When experts perceive a given situation in their domain, they are able to organize the information presented in larger patterns; conversely, they are able to recall more information. The process of pattern recognition occurs so rapidly that it may take on the character of intuitions. This finding has been replicated over a number of domains ranging from chess, the game of GO, reading circuit diagrams and architectural plans, interpreting x-ray plates, and computer programming. Outside of their domain, however, experts' perceptual skills resemble that of novices.

3) Experts are fast: they are faster then novices at performing the skills of their domain, and they quickly solve problems with little error. This ability comes as a result of the larger amount of practice, which makes the skill automatic and frees up memory capacity for processing other aspects of the task. In problem solving situations, experts are faster because they are able to recognize larger patterns and move toward solution without extensive searching.

4) Experts have superior short-term and long-term memory. Experts' ability to recall recently presented information seems to exceed the limits of short-term memory, because of their ability to chunk larger amounts of detail information. They also excel in long-term memory recall. Chess masters, for instance, are often able to recognize plays from a number of well-known games. Again, this ability is domain specific. Outside their domain, experts and novices are similar in their memory

5) Experts see and represent a problem in their domain at a deeper (more principled) level than novices who represent problems at a superficial level. Expert physicists, for instance, use principles of mechanics to organize categories, whereas novices built their problem categories around literal objects stated in the problem description. Both experts and novices use conceptual categories, but experts' categories are based on domain-specific principles and rules, while the novices' categories are surface-feature oriented.

6) Experts spend a great deal of time analyzing problems qualitatively. Chase and Simon (cited in Posner, 1988) have argued that masters level chess players have spent between 10,000 and

20,000 hours, or ten years, analyzing chess positions. When comparing thinking aloud protocols of experts and novices, researchers were able to show that experts typically try to understand the problem by building a mental representation from which they can infer relations that define the situation. Experts begin by defining the situation and seeking information about the initial situation, and spend more time on initial problem representation. The expert approach decreases the amount of thinking required to produce a good solution; by moving the problem to a higher, abstract level, situational and other constraints are either included in the solution or become irrelevant. Novices, on the other hand, work directly from a specific problem statement and seek to provide problem solutions much faster. This leaves the solution of specific constraints to be done after a potentially unwieldy set of possible solutions has been generated.

7) Experts have strong self-monitoring skills. Experts seem to be more aware than novices of when they make errors, why they fail to comprehend, and when they need to check their solution. The greater self-monitoring skills and self-knowledge of experts are due to their greater domain knowledge and the different representation of that knowledge, which allows them to predict problem difficulty on the basis on underlying principles rather than less relevant surface features.

Holyaok (1991) described a series of inconsistencies of second-generation theories, and proposed a third generation of theories build on connectionist principles where expertise is represented not in large schemata, but in networks of small units of knowledge that can be processed or accessed rapidly and in parallel by experts.

Development of expertise

An early theory was proposed by Fitts (1964) who proposed a developmental model of skill acquisition consisting of three stages: (a) cognitive, (b) associative, and (c) autonomous. In the first stage, the learner/novice tries to determine what must be done and how it is done. This stage involves an initial encoding of the skill sufficient to permit at least some crude approximation of the behavior required, and the individual will remain at this level until the task can be done correctly. The learner will often verbally rehearse the information associated with the skill. The second stage involves a smoothing out of the skill performance. Any errors in the initial understanding or performance of the skill are gradually detected and eliminated. Verbal mediation also decreases as the learner becomes more proficient at the skill. Polanyi (1962, in Johnson, 1987) compared this stage of the skill acquisition process to the master/apprentice situation, where, through verbal and non-verbal interaction, the expert is able to focus the attention of the novice on certain aspects of the task. This assistance results in a shift where the novice, who formerly concentrated on the specific subcomponents of the task, begins to look at the task from a gestalt perspective. This switch in awareness leads to the third stage of the model, where behavior becomes automated as a result of extensive practice in the second stage. Because the task is now being completed almost automatically, the short term memory is freed up and may be used for other tasks. At this stage, the individual performs somewhat automatically, and may no longer be able to report what knowledge is being used to complete the task. Improvements of the task performance at the third level may continue indefinitely.

Anderson (1982) built on Fitts' theory in formulating a general framework for the acquisition of cognitive skills, the ACT system. The systems proposed two major stages, the declarative stage, in which facts about the skill domain are interpreted, and the procedural stage, where "the domain knowledge is directly embodied in procedures for performing the skill" (Anderson, 1982, p. 369). These two stages are similar to Fitt's cognition and automated behavior stages. Fitts' second stage is seen by Anderson as a transition stage where "practice of knowledge is converted into a procedural form in which it is directly applied without the intercession of other interpretive procedures" (Anderson, 1982, p. 370). Declarative knowledge is gradually transformed into procedural knowledge through the process of knowledge compilation, which is posited to consist of two subprocesses: composition, where several subtasks which follow each other in solving a particular problem are collapsed or chunked into a single task (resulting in speed-up of the task), and proceduralization, whereby automated versions of the task are built that no longer require domain-specific declarative information to be retrieved into working memory .

Research Agenda

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1) Construct Validation of Expertise A glaring issue is the imprecise and ambiguous status of the concept. Construct validation research needs to be undertaken that a) bounds the construct and delineates its relationship to related constructs within a nomological network. Only when we understand how expertise differs from skill, knowledge, ability, competence, learning, effort, performance, training, education, etc. will we be able to ascertain whether, in fact, the construct is useful for scientific theory. Such an endeavor will also need to define expertise in terms of processes associated with it, rather than its outcomes.

2) Domains of expertise If, as cognitive research claims, expertise is domain-specific, there is a need to conceptually and empirically define domains. Taxonomies need to be developed that specify whether expertise relates to skills (expertise in welding) or contexts (welding at a shipyard). This question is of particular importance for ill-defined tasks, such as management. Questions of transfer of expertise from one domain to another are also of importance in this area.

3) Contextual factors Much of the experimental expertise research has deliberately isolated expertise from contextual issues. There is, substantial evidence, that learning and competence are is situation-bound. Rogoff (1984), for instance, argued strongly for a naturalistic approach in studying expertise, because laboratory studies artificially exclude contextual variables and influences that may well be an integral part of an individual's behavior. She asserts that

> thinking is intricately interwoven with the context of the problem to be solved. The context includes the problem's physical and conceptual structure as well as the purpose of the activity and the social milieu in which is imbedded. One must attend to the content and the context of the intellectual activity in order to understand thought processes....Context is an integral aspect of cognitive events, not a nuisance variable. (Rogoff, 1984, pp. 2 - 3)

4) The Expertise of groups The majority of expertise research has focused on individuals working by themselves on individual tasks. This is, however, not the mode of work for the large majority of employees. In order to be useful for the organization, individual expertise must be shared, integrated with the expertise of others, and integrated into the larger organizational context. This integration and coordination should, optimally, lead to group or team-level expertise, organization-level expertise, industry-expertise, and lastly, societal and global expertise, an area addressed by the literature on organizational learning.

5) The development of expertise Scant attention has been paid to the development of expertise within the organizational context. Becoming an expert takes time and involves a complex interplay of external and internal processes. Given the slow rate of maturation in highly complex knowledge areas, it stands to reason that there may be limits to the degree by which this process can be sped up. Training and development certainly play a role, but so does the application of learning in a trial and error mode. Learners invariably make mistakes and the degree to which organizations can provide such room for experimentation may well decide the rate of development of expertise. As a somewhat counterintuitive consequence, organizations who want to nurture experts, should be prepared to provide room for people to fail, rather than expecting 100% success at all times. A related consequence is that the practice of job rotation and frequent reassignment of personnel may inhibit the development of expertise, provided that there is too little domain overlap between the assignments for meaningful building of expertise in a given domain.

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Job Performance Goals: Bridging the Gap from Theory to Practice

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Job performance goals can be central components of a variety of performance management activities. Performance goals serve as the basis of performance appraisals, job design, employee training, and other efforts to improve performance. However, performance goals have failed to serve a central role in these interventions. The lack of an integrated theoretical framework for developing performance goals is shown to be an underlying cause of their disappointing record. A theoretical framework is presented to address the need for more effective performance goals. Empirical research is needed to assess the theoretical contribution of the framework presented. A strategy for conducting this research is suggested.

Job performance goals provide guidance to individuals in two important areas. They specify *what* is to be accomplished on-the-job and indicate *how well* it is to be accomplished. Few concepts are as central to performance improvement efforts and as broadly applicable to the workforce as the development of meaningful performance goals to guide work activities. Drucker (1974) was an early advocate of linking the performance goals of the organization to the goals that guide the work of individuals. The organizational goals that result from answering Drucker's questions, "What is our business and what should it be?," are the basis for specifying individual performance goals. "The goals of each managers job must be defined by the contribution he [sic] has to make to the success of the larger unit of which he is a part . . . . He must know and understand the ultimate business goals, what is expected of him and why, what he will be measured against and how" (p. 438). Rummler (1980) expanded upon Gilbert's (1978) pioneering work in human performance by specifying the systemic links among individual task accomplishment, job outputs, and organizational goals. He demonstrated that job performance goals must be based on the linkage between individual accomplishments and organizational goals. Robert Mager (1984) also discussed performance goals in terms of the "desired outcomes" to be achieved, and acknowledged that even abstract goals involving attitudes or creativity can be systematically described by identifying the performances and outcome states that best capture the meaning of the goal.

The Central Role of Performance Goals

Performance goals that accurately specify what and how well job outcomes are to be accomplished can serve a number of important performance management roles in organizations. Job performance goals should be prominent features of performance appraisals, job design, employee training and development, and other initiatives that affect the content and structure of work activities. In each of these areas job performance goals should provide individuals with meaningful guidance to assure that work efforts are both personally fulfilling and well aligned with the broader needs of the organization. Because they specify the key outputs of jobs, job performance goals provide the core framework around which jobs are designed. Jobs that are flexibly designed around outputs can be reconfigured as organizational needs and customer requirements change (McLagan, 1990). Job analysis traces the work flow needed to produce work outputs and is an important tool for work redesign. At a time when the content and methods of work are continually changing, performance goals provide necessary direction for efforts to redesign jobs.

Accurate and meaningful performance goals should also be a central feature of performance appraisals. The key outputs and quality standards of one's work must be established if performance appraisals are to provide an equitable basis for compensation, promotion, and other personnel decisions (Mohrman, Resnick-West and Lawler, 1990). Employee training to improve work performance must also be based on an analysis of performance requirements and the training and

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non-training factors that contribute to meeting these requirements (Rossett, 1992; Swanson, 1994). Each of these interventions promotes the development and management of employee performance. To fulfill these roles, each intervention must be based on accurate and meaningful job performance goals.

However, performance goals have not lived up to the high expectations we have set for them. In many cases meaningful job performance goals either do not exist or employees consider the goals they have to be largely irrelevant to their jobs. There are a number of reasons why performance goals have not lived up to expectations. This article will examine the reasons for the gap between the actual and potential role of job performance goals. It will suggest ways in which this gap can be bridged by systematically examining how performance goals are developed in organizations. To help close the gap between theory and practice, a theoretical framework for the development of performance goals will be presented. This theoretical framework will become the conceptual point of departure for field research to study the factors that shape the development of effective performance goals.

The Poor Record of Job Performance Goals

Job performance goals have failed to serve a central role in performance improvement efforts. Although performance goals should be the basis of performance management activities such as performance appraisals, job design, and training and development, they have not provided the kind of core guidance for improving performance expected of them. For example, much has been written about the shortcomings of performance appraisals to effectively manage performance. Although virtually every organization uses some type of performance appraisal, most organizations do a poor job of appraising employees and few are satisfied with the processes or outcomes of performance appraisal (Locher and Teel, 1988; McLean, Damme and Swanson, 1990; Mohrman, Resnick-West and Lawler, 1990). Poorly-specified performance goals have been implicated as an major contributor to ineffective performance appraisals. Several studies have shown that performance goals simply do not provide a clear basis for assessing employee performance. For example, while supporting the need for goal setting in the appraisal process, Dorfman, Stephan and Loveland (1986) found that performance goals frequently do not accurately reflect job responsibilities. Harkness and Mulinski (1988), in their study of performance standards for social workers, also demonstrated that performance goals do not accurately reflect job tasks and responsibilities. In addition, irrelevant or unrealistic performance goals are often cited as contributing to employees' distrust of the performance appraisal process and of the supervisors who frequently set performance goals (Bannister, 1986).

Numerous studies have been conducted in an effort to improve performance appraisal practices, including those that have examined the need for more relevant performance goals (Gunn, 1993; Harkness and Mulinski, 1988). Yet, evidence suggests that efforts have not been made to apply research findings in ways that improve practice. Maroney and Buckely (1992) argue that, while many aspects of the performance appraisal process have been researched, including the perceived accuracy of the performance standards used in the appraisal process, these research findings have not been integrated into practice.

Similarly, the use of performance goals in job descriptions have proven equally ineffective as guides to performance. While many employees have job descriptions, few ever refer to them for performance guidance (Davidson, 1986). The guidance provided in job descriptions is usually too general to be helpful and is not based on performance objectives that are specific, measurable, achievable, results-oriented, and timely (Bricker, 1992). Job descriptions that do not describe performance goals in ways that are meaningful to employees are of little value in shaping performance.

Similarly, employee training programs are rarely based on a systematic analysis of organizational performance requirements. The analysis supporting performance-oriented training must link performance needs at the organization, process, and individual levels (Rummler and Brache, 1995), and must include an analysis of the work processes within which performance is to be improved (Swanson, 1994). However, rarely is rigorous work analysis conducted as the basis of training. As a result, training often addresses employee capabilities that contribute only marginally to organizational needs (Campbell, 1990). Job performance goals are an important by-product of work analysis. However, if no attempt is made to analyze work processes, the

performance goals will remain obscure and training may be ineffective. Fortunately, recent contributions to the field of HRD hold some promise of a trend toward more performance-based training (Jacobs and Jones, 1995; Swanson, 1994; Robinson and Robinson, 1995).

Additional reasons why performance goals have not been a central force in performance management activities follow from the assertion that, in many settings, performance goals are simply not easy to specify. In a rapidly changing business environment where products, services, and production methods are undergoing constant transformation, performance goals are less stable and, therefore, more difficult to identify. This is particularly true in high technology environments where organizational structures are fluid, products and markets are undergoing constant change, and work methods require high levels of worker interdependence. Mohrman, Mohrman and Worley (1990) found that traditional goal-setting methods, such as management by objectives (MBO), are unrealistic in these settings and that using them leads to high levels of employee dissatisfaction.

Fragmented Research on Goal Setting. Another barrier to the effective use of performance goals is that the research on performance goals has been fragmented along disciplinary lines. Researchers in the fields of management and psychology have studied goal-setting most extensively, yet their work has diverged into two, non-overlapping bodies of knowledge about the same phenomenon. Research on goal-setting in psychology has typically been done with individual subjects using quantitative, experimental designs in laboratory settings. These studies usually do not exceed one hour in length, the goals are determined by the experimenter in advance, commitment to the goals is routinely obtained, and the goals apply to simple, straightforward tasks. While these conditions are conducive to experimental research designs, they admittedly fail to capture the organizational context in which real performance goals are adopted.

On the other hand, goal-setting research in the field of management has been conducted almost exclusively in the field where the unit of analysis is usually the organization, rather than the individual. Because controlled conditions are difficult or impossible to achieve in this context, correlational and case study research methods have been used. Unlike laboratory studies, organizational research must accommodate multiple goals that are often in conflict because they have been proposed by different interest groups. Goal complexity is taken for granted and commitment to goals cannot be assumed. In short, psychology lab studies and management field studies share little in common, even though they both seek greater understanding of the role of performance goals in the workplace. Psychological research has examined performance goals isolated from the context in which they are adopted. Management research has examined the environmental and strategic determinants of goals without driving the implications of these goals deep enough into the organization to influence individual performance.

It is unfortunate that there has not been more cross-disciplinary exchange in goal-setting research. These two research approaches artificially disconnect the systemic continuity of performance goals into individual and organizational domains. This lack of convergence in goal-setting research has fragmented the study of goal-setting as a performance improvement strategy and it has prevented the advancement of performance goals to a central position in performance improvement efforts.

What should be clear from the preceding discussion is that, while much attention has been given to the study of goal-setting, a holistic theory for the development of effective performance goals is lacking. There is no unified conceptual basis for how to develop job performance goals that meet *both* individual and organizational needs. A comprehensive theoretical framework is needed. In the next section, key goal-setting constructs will be reviewed and integrated into a theoretical framework for developing performance goals. Then, a research strategy adapted from Yin's (1994) approach to case study research will be suggested as the method of choice for empirically testing this theoretical framework.

A Theoretical Framework for the Development of Performance Goals

Performance goals that meet organizational needs but not individual needs may enjoy temporary support from some employees, but will ultimately be abandoned by those who seek fulfillment from their work. On the other hand, performance goals that meet individual needs but not organizational needs are not likely to be adopted by the organization in the first place. Thus, a major premise underlying the proposed theoretical framework is that performance goals must be developed to meet both organizational and individual needs.

In the next section, a key feature of the proposed theoretical framework, known as *organizational alignment*, is described. Then, in the following section, the goal-setting concepts that address the *individual needs* component of the framework will be examined. Together, *individual needs* and *organizational alignment* constitute the major conceptual components of the framework.

Organizational Alignment of Performance Goals. For goal-setting to serve as a performance improvement strategy, performance goals must be aligned at multiple levels of the organization. Several models have specified levels of the organization at which performance efforts must be coordinated if the overall performance of the organization is to be optimized. Three such models are briefly reviewed next.

Odiorne's (1985) system for developing performance objectives for managers begins with specifying goals at the strategic level. Strategic goals are then converted into operational terms to guide departmental activities. Operational goals then become the requirements against which individual goals are set. In this way, job goals are linked directly to broader organizational requirements.

Noel Tichy, an early advocate of the strategic role of human resource management, offered another tiered model of organizational performance (Tichy, Fombrun and Devanna, 1982). He was the first to demonstrate that human resource functions such as employee selection, training and development, and reward systems could be accomplished at three levels: strategic, managerial, and operational. Tichy suggested that human resource professionals focus more attention on the strategic management of human resources, even if this is at the expense of operational concerns. Tichy's three levels of human resource management have been used to audit the strategic alignment of HRD (Torraco, 1992).

Rummler and Brache (1995) have also developed a three tiered model of organizational performance. Their "three levels of performance" model clearly maps out how performance goals should be linked at the individual, process, and organization levels. According to Rummler and Brache, the outcomes of individual performance must contribute to functional or process goals, which, in turn, should be linked to organizational goals.

Each of these models identifies levels of the organization at which performance goals should be aligned. In their own way, each of these models explicitly acknowledges the systemic nature of organizations. Because organizations behave as complex systems, the performance of individuals and groups must be managed at several levels simultaneously. Jobs must be designed such that job outputs contribute to a systemic value chain that ultimately meet customer needs.

Individual Needs and Performance Goals. Job performance goals should provide individuals with meaningful guidance to assure that work efforts are both personally fulfilling and well aligned with the broader needs of the organization. Several important goal-setting constructs have been well-supported by research and can be used as prescriptions for how goals should be developed to meet individual needs. Four such goal-setting constructs are described next.

First, one of the most robust findings in goal-setting research is that higher levels of task performance result from setting goals that are specific and challenging. Studies have consistently confirmed that setting clear, specific goals focuses attention and effort and leads to higher performance than not providing such goals, or than simply admonishing people to "do their best" ((Locke, Shaw, Saari, and Latham, 1981). Setting challenging goals leads to greater effort and persistence than is expended for easy goals. As long as goals are seen as feasible, higher levels of performance can be expected as employees strive to reach more challenging goals (Locke and Latham, 1990).

Second, employee commitment to goals is increased if employees are involved in determining how goal attainment will be measured. Commitment to goals is increased as employees perceive that the measures used to assess goal attainment are fair and represent means over which they have control (Locke and Latham, 1990). In addition, participation in goal-setting should be encouraged to the extent higher goals are often set through employee involvement than would be set by managers alone (Kondrasuk, 1981; Latham, Mitchell and Dossett, 1978).

Third, performance goals should be used for their own developmental value (Latham and Yukl, 1975). Social learning theory maintains that we hold mental representations of future outcomes and that our expectations of successfully achieving these outcomes can motivate learning and new behavior (Bandura, 1977). Just as learning objectives are used in the classroom and in other settings to guide learning, performance goals can be used to develop new skills in the workplace. Those responsible for setting goals should be trained in the developmental potential of goal-

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setting. Setting goals and providing feedback on goal achievement represent two of the most well-supported constructs in behavioral science research.

Fourth, performance goals should be developed to accommodate employee preferences for how an outcome is accomplished, as well as for what the goal itself should be. We should be able to accommodate employee needs for skill variety, task identity, task significance, autonomy, and feedback as a way to enhance employee satisfaction and performance (Hackman and Oldham, 1980). Because these characteristics describe how work is done, they can be applied to the performance goal side or to the task design side of the performance continuum. Thus, a theoretical framework for developing performance goals should be responsive to employee needs for goals that reflect these characteristics.

In summary, the performance goals that are responsive to individual needs should be specific and challenging goals, they should be developed through participatory processes, they should be used for developmental as well as performance management purposes, and goals should represent work that is designed to meet individual needs.

An Integrated Model. Together, the two major conceptual components of *organizational alignment* and *individual needs* constitute the theoretical framework for goal-setting (see Figure 1. Theoretical Framework for the Development of Performance Goals). A major proposition derived from this theoretical framework is that performance goals that reflect *organizational alignment* and that respond to *individual needs* will command a central position in an organization's efforts to improve performance.

This framework for goal-setting will serve as the theoretical point of departure for empirical research to validate a theory that effectively guides the development of performance goals in organizations. A research strategy adapted from Yin's (1994) approach to case study research is suggested as the method of choice for empirically testing this framework.

Figure 1. Theoretical Framework for the Development of Performance Goals

A Research Strategy

A theoretical model should provide a system of key concepts and their interrelationships that clearly explain a phenomenon of interest. The theory should explain the operational dynamics of the phenomenon (i.e., how it works), it should give the boundaries of the domain over which the theory is expected to apply, and it should show how the phenomenon interacts with its environment (Whetten, 1989). The theoretical framework presented here for developing performance goals emphasizes the need for performance goals that are aligned at various levels of

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the organization and that meet individual needs. While this theoretical framework may have some intuitive appeal, it will offer little additional value to organizational scholars and practitioners unless its ability to explain goal-setting phenomena can be tested and validated through empirical research. Newly developed theories can be tested by specifying propositions that are logically derived from the theory, and then testing these propositions through research in the real world (Dubin, 1978). A key challenge to researchers is adopting a research strategy that is appropriate for testing such a theory.

Quantitative, experimental methods have been successfully used to examine the influence on goal-setting of individual expectancies, knowledge of results, commitment, goal difficulty, and other variables (Locke, Shaw, Saari, and Latham, 1981). However, a multitude of contextual factors influence how performance goals are adopted in organizations that are not accounted for in psychological research. Strategy and market issues external to the organization affect the adoption of performance goals, as do technological and interpersonal factors internal to the organization. Experimental and quasi-experimental research cannot be designed for the degree of control and standardization needed to demonstrate causal relationships between goal-setting variables and organizational outcomes. Organizations devise strategies and set goals in uncertain, unpredictable environments. It is difficult enough to construct reliable and valid measures of these variables, let alone demonstrate causal relationships among them (Richards, 1986; Snow and Hambrick, 1980).

The Case Study Research Method. The investigation of complex goal-setting phenomena that operate at multiple levels (i.e., organization, process, and individual) requires a research strategy that is more sensitive to context than traditional quantitative approaches. In these instances, idiographic and case study methods of research are well suited for the kind of in-depth study required to examine complex organizational phenomena (Luthans and Davis, 1982; Mintzberg, 1979). These methods are particularly useful for empirical research on the development of performance goals where the boundaries between phenomenon (how performance goals are developed) and context are not clearly evident.

A research strategy that is compatible with this type of inquiry is Yin's case study research methodology (Yin, 1994). Yin's approach requires the collection of extensive data in order to produce an in-depth understanding of the entity under study and is well suited for the development and testing of theory. According to Yin, the case study is the preferred research strategy "when *how* or *why* questions are being posed, when the investigator has little control over events, and when the boundaries between phenomenon and context are not clearly evident" (p. 13).

The primary goal of the proposed research is the validation of a theoretical framework that explains how performance goals are developed in organizations. Consequently, "statistical generalization" for making inferences about a population on the basis of empirical data collected from a sample of organizations is not relevant here. Rather, this research involves generalizing from case study to theory. Yin calls this "analytic generalization," in which a previously developed theory is used as a template with which to compare the empirical results of the case study. If two or more cases are shown to support the same theory, replication may be claimed. The empirical results are considered even more potent if two or more cases support the same theory but do not support an equally plausible, rival theory (Yin, 1994).

Multiple-Case, Embedded Units of Analysis Design. Empirical testing of theory through case studies requires that propositions be logically derived from the theory, which are then used to guide the researcher to the data to be collected to answer the central research question(s). The central research question here is, "How are job performance goals developed to meet both individual and organizational needs?" For this research, a multiple case study design would be used in which data on the development of performance goals would be collected from two or more organizations. Although the main unit of analysis would be the organization, another level of analysis "embedded" in the organization would also be used to study the development of performance goals. This "embedded unit of analysis" would be at the employee-supervisor level where job performance goals are often developed. Thus, the case study research would follow a "multiple-case design with embedded levels of analysis" (Yin, 1994).

Research questions are then posed to examine the validity of each proposition. Separate questions posed at the organization and process levels would examine the degree of alignment of performance goals throughout the organization. Questions would also be posed at the employee-supervisor level of analysis to test propositions from the theory about how performance goals are developed to meet individual needs. Throughout the research, an attempt is made to establish a "chain of evidence" to insure that the research evidence ultimately addresses the original study

questions. Explicit links should exist between the propositions, the data collected, and the conclusions drawn. In addition, emphasis is given to using multiple sources of evidence, that is, evidence from two or more sources, but converging on the same set of facts or findings.

Yin's case study methodology provides a focused approach to answering the main research question and it allows for sensitivity to context. In short, Yin's approach to case study research is the method of choice for conducting research on how performance goals might be more effectively developed in organizations.

Summary. Accurate, meaningful job performance goals can be central components of a variety of performance management activities despite their disappointing record to date. Several reasons have been identified for the discrepancy between the potential and actual roles of performance goals. Underlying their disappointing performance is the lack of an integrated theoretical framework that adequately explains the need for performance goals to meet both individual and organizational needs. This paper has presented a theoretical framework that integrates the *organizational alignment* and *individual needs* components of performance goals. This preliminary framework serves as the theoretical point of departure for empirical research to refine and validate the theory. A strategy for conducting this research has been suggested that follows Yin's case study methodology.

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